

# **Technical Research in Advanced Air Transportation Concepts & Technologies**

## **Task Order 54**

### **Investigation of Implementation Sites for Multi-center Traffic Management Advisor (McTMA) AATT Decision Support Tool**

# Introduction

- **Background**
- **Task requirements**
- **Task description**
- **Selection criteria**

# Background

- **Advance air transportation technologies (AATT)**
- **Improve overall performance on the NAS**
- **Developing decision support tools (DSTs)**
- **DSTs grouped with FAA free flight phase 2 (FFP2)**
- **Multi-center traffic management advisor (McTMA) is planned to be part of FFP2**
- **McTMA will be initially standalone DST**
- **Mature McTMA will be integrated into a multi-center environment.**
- **Life-cycle cost/benefits require an implementation scheme**

# Task Requirements

- **Results serve two group at NASA Ames: AATT Benefits Assessors and McTMA Tool Developers**
- **Determine which TRACONs are multi-center facilities**
- **Thoroughly researched and documented by ARTS equipment**
- **Primary FAA support HQ FFP1 Program Office and AOS-400 at the FAA Technical Center**
- **Develop selection criteria for McTMA implementation**
  - **facility operational requirements**
  - **ARTCC/TRACON boundaries**
  - **airspace complexity**
  - **airport capacity/delay**
  - **weather phenomena**

# Task Description

- **Task 1 – Initial meeting at NASA Ames to further refine methodology for data collection**
  - Define sources where NASA may be able to facilitate or coordinate access to information
- **Task 2 – Application of a methodology to search for multi-center TRAcons**
  - A preliminary list of sites, selection criteria for each and supporting data was delivered to the NASA TM
- **Task 3 – Provide a final report and develop an informal presentation of the final results**
  - Results included the selection criteria and both a hard and soft copy of all data collected

# Selection Criteria

- **Facility Operational Requirements**
  - **FAA assigns a numerical rating or classification level to all air traffic facilities**
  - **Computed on a weighted hourly index of air traffic**
  - **Numerical value represents facilities functionality across a broad spectrum of different operational postures**
  - **Directly reflects controller skill application and facility complexity**
  - **Current forecast predicted a annual growth rate of approximately 2.8 percent for the period 2000 – 2001**
  - **In general terms, higher service levels indicates more air traffic handled**

# Selection Criteria

- **ARTCC/TRACON Boundaries**
  - Lateral and longitudinal boundaries are important
  - Clearly defined arrival and departure profiles
  - Distances up to 200 nm routinely used in single-center TMA alignment
  - Overlapping airspace boundaries between Center and TRACON considerable
  - ARTS must be able to handle both host and non-host data
  - Adaptation for each facility must be determined
  - No single measure to qualify TRACONs by boundaries

# Selection Criteria

- **Airspace Complexity**

- **Operational posture is an important element**
- **McTMA at multi-center TRACONs should be determined based on airspace complexity during FFP2 – 2003**
- **Airspace complexity issues to include: demand, airspace redesign, ATC procedures, support systems, logistics, labor, and certification**
- **Isolate airspace in a terminal environment by geographical area in lieu of treating each airport as an individual part**
- **Should be considered as a key element in determining an implementation scheme for McTMA**



# Selection Criteria

- **Airport Capacity/Delay**

- Measure individual airport capacity
- Examine aircraft delay for designated carrier operations
- Routine delay is normally an indicator of a high volume facility
- Normal delay range from 7 to 13 percent of the total traffic count for most medium to large size metropolitan airports
- Review FAA's Aviation Capacity Enhancement Plan
- Introduction of McTMA could notably improve system operability at designated airports

# Selection Criteria

- **Weather Phenomena**

- Weather phenomena variable with impact on the ATC system that can not be specifically forecast
- Use previous years statistics
- Compare percentage of IFR versus VFR days
- Apply to arrival and departure data to derive assessment impact
- Not all weather can be circumvented by improved DSTs
- Inclusion of DSTs could enhance operability and maintain an airports runway acceptance in certain conditions

# Implementation Methodology

- **Current filter identifies only “true” multi-center TRACONs**
- **Selection criteria must be further refined by AATT Benefits Assessors and McTMA Tool Developers**
- **Weighted measures must be applied to selection criteria**
- **Determine level of importance considering dynamics of the National Airspace System at each location**
- **Assess air traffic forecast for FFP1 and FFP2 timeframes**
- **Add filters to identify and implement a strategy for McTMA deployment to multi-center TRACONs**
- **Prioritize implementation scheme on what NASA and/or FAA perceives appropriate, include operational needs of each facility**

# **Multi-center TRACONs Sort by FAA Facility Level**

- **See attached Microsoft Excel TRACON File**

# Multi-center TRACONs Sort by FAA Region

- See attached Microsoft Excel TRACON File

# **Multi-center TRACONs Sort by FAA Primary ARTCC**

- **See attached Microsoft Excel TRACON File**

# **Multi-center TRACONs**

## **Sort by FAA Operational Support Facility (OSF)**

- **See attached Microsoft Excel TRACON File**

# Air Route Traffic Control Centers (ARTCCs)

- See attached Microsoft Excel TRACON File